



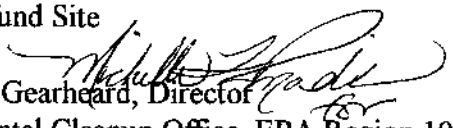
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, WA 98101

November 7, 2001

Reply To
Attn Of: ECL-117

MEMORANDUM

SUBJECT: Response to National Remedy Review Board Recommendations for the Bunker Hill Superfund Site

FROM: Michael F. Gearheard, Director 
Environmental Cleanup Office, EPA Region 10

TO: Robin M. Anderson, Acting Chair
National Remedy Review Board
Office of Solid Waste and Emergency Response

This memorandum provides Region 10's response to the advisory recommendations of the National Remedy Review Board (NRRB) regarding the proposed amended remedy for the Bunker Hill Superfund Site (Site or "box") in Kellogg, Idaho. The remedial actions address one portion of the 1992 Record of Decision for the Non-Populated Areas of the Site, the management of acid mine drainage from the Bunker Hill mine. The NRRB's recommendations were provided in a memorandum to me dated May 8, 2001. Please find our responses below.

Response to NRRB Advisory Recommendations

- **Comment 1:** Based on the information contained in the package, alternative 2 (acid mine drainage (AMD) treatment plant improvements only) appeared to represent the lowest cost protective remedy for the site given its lower capital and operation and maintenance (O&M) costs. The board recommends that the proposed plan and Record of Decision (ROD) include better justification to support selection of alternative 3. If alternative 3 is selected, the board supports a phased approach with mitigation measures starting at locations of most significant effect on AMD quality and volume (i.e., Milo Creek infiltration) in order to reduce volumes of water to be treated.

Response: We agree that Alternative 2 is the least costly. Alternatives 3, 4, and 5 all employ flow reduction measures (mitigations) making them more costly. Compared to Alternative 2, the O&M costs for the proposed Selected Remedy (Alternative 3) are higher. These increased costs result primarily from several additional remedy components associated with Alternative 3 that are not included in Alternative 2. We believe that the flow reduction measures, costs associated with the temporary monitoring program to assess the effectiveness of these measures, and a more effective in-mine storage system are necessary improvements and will result in a more cost-effective remedy in the long

term. Idaho Department of Environmental Quality (IDEQ) also believes that these efforts provide safeguards that are commensurate with their increased costs. The capital and O&M costs associated with several other remedy components including treatment and sludge management are actually lower for Alternative 3 when compared to Alternative 2. This is a result of reductions in the amount of AMD generated, sludge produced, and lime used at the Central Treatment Plant (CTP) that are expected under the Selected Remedy. This has been clarified in the Proposed Plan and in the draft ROD Amendment.

We propose to select the phased approach to implementing flow reduction measures as noted by the NRRB in Comment 1. While the specific effectiveness of all the flow reduction measures is unknown, Alternative 3 includes actions with the best chance of reducing peak AMD flows from the Kellogg Tunnel, and a phased approach to implementing additional flow reduction measures and treatment plant sizing. This phased approach allows careful consideration of the most cost-effective ways to reduce mine water flow and optimize treatment plant size, and provides flexibility to benefit from new information gained during installation and operation of initial flow reduction efforts and treatment capacity. Because of the uncertainties associated with mitigation effectiveness, the additional mitigations of Alternatives 4 and 5 could not be determined to be more effective than those of Alternative 3. The phased approach will provide information to reduce these uncertainties.

- **Comment 2:** The package as presented to the board did not clearly justify a need for remedial action based on human health or ecological risk; instead, it based its evaluation of threat on simple exceedances of water quality standards. The board recommends that the region clarify the benefits of the proposed action in terms of human health and ecological risk reduction.

Response: EPA Region 10 did not conduct a formal, quantitative risk assessment for the ROD Amendment. Because the component of the original remedy being amended focused on discharge from the Bunker Hill CTP, Idaho water quality standards and federal national recommended water quality criteria were used to identify acceptable contaminant concentrations for human health and aquatic organisms. In addition, two risk assessments previously conducted for the Site have already established Site risks in excess of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) risk range and protective concentrations for ecological organisms (See *Ecological Risk Assessment for the Bunker Hill Superfund Site, November 1991*, and *Human Health Risk Assessment for the Non-Populated Areas of the Bunker Hill NPL Site, June 1992*).

However, risks to human health and the environment in the absence of AMD treatment (the no-action alternative) were qualitatively evaluated against the water quality standards and criteria. Metals concentrations in untreated AMD are up to 2,200 times

greater than the applicable Idaho water quality standards for protection of freshwater aquatic life and human health for the contaminants of concern. Untreated AMD entering the South Fork Coeur d'Alene River (River) would raise surface water concentrations of several metals to several thousand parts per billion, doubling or quadrupling current dissolved metals concentrations and loads. These concentrations would be lethal to resident fish populations and would preclude fish migration through the affected portion of the River. Exceedances of current and proposed maximum contaminant levels (MCLs) and maximum contaminant level goals (MCLGs) would occur. Use of surface water impacted by untreated mine water as a drinking water source would present an excessive human health risk. These risks to human health and the environment have been clarified in the draft ROD Amendment.

Comment 3: The region and state have developed Total Maximum Daily Loads (TMDLs) criteria for the Coeur d'Alene Basin as part of a water quality management program for the entire watershed. The board notes that the preferred alternative will meet the Idaho water quality standard and in general meets the TMDL allocation for the Operable Unit 3 (OU3) discharge at no additional cost. However, the package is unclear in its description of applicable or relevant and appropriate requirements (ARARs). For example, the board notes that some language (e.g., Remedial Action Objective #2) could be misinterpreted as suggesting that TMDLs are ARARs. The Region should clarify this language where it appears. The board also recommends that the ROD clearly identify which federal and state requirements are applicable, which are relevant and appropriate, and which are "to be considered" (TBC).

Response: In the Remedial Investigation/Feasibility Study (RI/FS) and draft ROD Amendment, we have identified the *Total Maximum Daily Load (TMDL) for Dissolved Cadmium, Dissolved Lead, and Dissolved Zinc in Surface Waters of the Coeur d'Alene River Basin (August 2000)*, released by IDEQ and EPA, as a TBC for this action. In addition, as suggested, the draft ROD Amendment clearly identifies which federal and state requirements are applicable, which are relevant and appropriate, and which are TBC.

Comment 4: The board's package focused primarily on water and waste/residuals management strategies that address OU-specific contamination. Given the wide range of water treatment sludge and sediment management activities anticipated for the broader Coeur d'Alene basin as a result of the final basin-wide cleanup, the board encourages the region to continue to review and coordinate facility design issues for this action with the broader cleanup needs of the basin.

Response: We agree with the Board's recommendation and have already taken steps to integrate cleanup activities within the "box" and the greater Coeur d'Alene River Basin (Basin). For example, we have recently hired a Team Leader with overall project management responsibility for both the "box" and Basin projects. In addition, the "box"

site-wide surface water and ground water monitoring program is currently being evaluated and enhanced in order to ensure the collection of data that will allow comparison of contaminant sources within the "box" to sources within the Basin. This type of information will be used to set priorities for future project funding. For the Mine Water ROD Amendment, the central treatment plant could possibly be expanded to accept other contaminated water sources in the Basin. Various factors would first have to be assessed including any physical limitations, the quality and quantity of any additional sources, and the need for treatability studies, process changes, and treatment capacity upgrades. Finally, the selected approach for CTP sludge disposal as identified in the ROD Amendment will provide a means for coordination regarding "box" and Basin disposal needs.

- **Comment 5:** The board notes that sludge management option A (using the central impoundment area (CIA) for disposal of water treatment sludge) will result in significant cost savings (>\$4.5 million) over the other sludge management options. However, it appears that local land use planning for the CIA may impact whether this property is available for sludge management in the future. It is recommended that the region and the State of Idaho (which will be responsible for continued operation and maintenance) work with local land use planners and the community to further evaluate the potential benefits of Option A, before selecting the long term disposal options for the treatment plant sludges.

Response: This issue was also raised during the public comment period. EPA Region 10 and IDEQ plan to select sludge disposal Option A in the ROD Amendment. However, given concerns expressed during the public comment period about competing disposal needs, preserving developable site land, and the potential development of regional disposal areas in the future as part of the Basin cleanup efforts, we will implement sludge disposal in the following manner: 1) Perform initial upgrades to the CTP. These upgrades will reduce the current amount of sludge produced by about half, thereby extending the expected life of the current disposal area by up to 10 years; 2) When additional sludge disposal capacity is needed, reevaluate whether additional regional disposal capacity has become available as part of the Basin cleanup efforts that would make disposal outside of the "box" area more cost-effective. If so, pursue offsite sludge disposal. If not, construct one 10-year disposal bed on the southeast corner of the CIA; 3) Step 2 would be reconsidered prior to the construction of any additional sludge beds on the CIA.

- **Comment 6:** The board noted that the substantial variations in AMD flow rates and contaminant concentrations into AMD storage may present opportunities to reduce the treatment system needs during periods of high flow, with resultant capital and operation and maintenance cost savings. For example, the treatment plant would utilize the lined pond and in-mine storage to equalize the AMD flow. Permitting a portion of the flow to bypass the treatment plant under certain (but protective) conditions reduces the need for

lime and increases the service life of the filters. The board recommends the region consider these opportunities during remedy design.

Response: The flow rate of AMD from the Kellogg Tunnel portal does vary substantially. The average flow is about 1,500 gallons per minute (gpm), but peak flows have been documented at over 6,000 gpm. The historical flow data shows that the flow rate can increase relatively rapidly, from near average to peak conditions within a few days. Options for managing this flow change depending on the amount of storage available prior to the treatment plant and the treatment plant capacity. A larger treatment capacity requires less storage. Another option is to prevent the peak flows from occurring, or to reduce their magnitude. This approach is the objective of the AMD flow reduction measures described in the RI/FS, Proposed Plan, and ROD Amendment – specifically those which address the West Fork of Milo Creek. Preventing the peak flows from occurring is preferable over either storing or treating them. The Selected Remedy in the ROD Amendment also includes use of storage to manage flows that are in excess of treatment capacity. The lined pond provides 7 million gallons of storage, and the mine from 30 feet below 11 Level to the floor of 10 level provides about 210 million gallons. The option of bypassing flows around the treatment plant is not viable because the water quality of the AMD is too poor. A relatively small amount of bypass would exceed water quality standards.

We appreciate the Board's comments and assistance in this matter. We hope that our responses serve to fully address the NRRB's recommendations.